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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,622	03/18/2004	John McCafferty	05569.0004.DVUS11	6206

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EXAMINER	
STEELE, AMBER D	

ART UNIT	PAPER NUMBER
1639	

MAIL DATE	DELIVERY MODE
02/17/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/803,622	MCCAFFERTY ET AL.	
	Examiner	Art Unit	
	AMBER D. STEELE	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *1-8 and 10-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9 and 13-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *March 18, 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/726,219.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/10/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. The amendment to the claims received on August 8, 2007 amended claim 9.

The new claim listing provided on April 2, 2008 changed the status identifiers only.

The new claim listing provided on November 3, 2008 did not make any amendments or changes.

Claims 1-17 are currently pending.

Claims 9 and 13-17 are currently under consideration.

Election/Restrictions

2. This application contains claims 1-8 drawn to an invention nonelected without traverse in the reply filed on April 27, 2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

3. Claims 10-12 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on April 27, 2006.

Priority

4. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d) of United Kingdom application 9015198.6 7/10/1990; United Kingdom application 9022845.3 10/19/1990; United Kingdom application 9024503.6 11/12/1990; United Kingdom application 9104744.9 3/6/1991; United Kingdom application 9110549.4 5/15/1991.

The certified copies have been filed in parent Application No. 09/726,219, filed on November 28, 2000.

5. The present application claims status as a DIV of 09/726,219 11/28/2000 PAT 6,806,079 which is a CON of 08/484,893 06/07/1995 PAT 6,172,197 which is a CON of 07/971,857 01/08/1993 PAT 5,969,108 which is a National Stage application filed under 35 U.S.C. § 371 of PCT/GB91/01134 07/10/1991.

6. The request for a corrected filing receipt is acknowledged and has been forwarded.

Invention as Claimed

7. A method for producing a binding molecule specific for a particular target epitope or antigen, which method comprises the steps of: producing a population of filamentous bacteriophage particles displaying at their surface a population of binding molecules wherein each binding molecule in the population of binding molecules has a binding domain and the population of binding molecules has a range of binding specificities wherein the binding domain of the binding molecules consists of an antibody heavy chain variable domain and wherein each filamentous bacteriophage particle contains nucleic acid with a nucleotide sequence encoding the binding molecule expressed form the nucleic acid and displayed by the particle at its surface and selecting for a filamentous bacteriophage particle displaying a binding molecule with a desired specificity by contacting the population of filamentous bacteriophage particles with a target epitope or antigen so that individual binding molecules displayed on filamentous bacteriophage particles with the desired specificity bind to said target epitope or antigen and variations thereof.

8. Please note: an antibody heavy chain variable domain includes the following structures: FW1-CDR1-FW2-CDR2-FW3-CDR3-FW4; CDR1; CDR2; CDR3; etc. (i.e. any structure comprising an antibody variable domain).

Applicants assert in the response received on November 3, 2008 that an antibody heavy chain variable domain can only have the structure of FW1-CDR1-FW2-CDR2-FW3-CDR3-FW4 and point to the specification (see paragraph 5 of the PGPub) which reads "[t]he heavy chains have four domains, one corresponding to the V region and three domains (1, 2, 3) in the C region…each V region is made up of from three complementarity determining regions (CDR) separated by four framework regions (FR)".

It is the position of the examiner of record that a "region" is a "domain" (also see the present specification, paragraph 5 where the terms are utilized interchangeably; "four domains, one corresponding to the V region and three domains (1, 2, 3) in the C region). Therefore, "an antibody heavy chain variable domain" is interpreted as FW1-CDR1-FW2-CDR2-FW3-CDR3-FW4; CDR1; CDR2; CDR3; etc. (i.e. any structure comprising an antibody variable domain/region). In addition, the specification (paragraph 5) first "defines" heavy chains as having a V (i.e. variable) region and three C (constant) regions wherein the V region is further broken down into three complementarity determining regions (CDR; variable portion of V region) and four framework regions (FR/FW).

Withdrawn Rejection

9. The rejection of claims 9 and 14-17 under 35 U.S.C. 103(a) as being unpatentable over Ladner et al. WO 90/02809 published March 22, 1990 and Weir et al. J. Biochem. 100: 69-72, 1966 is withdrawn upon further consideration. Even though binding is dependent on the variable domain in the heavy chain, since the present claims have a closed limitation of "consists of an antibody heavy chain variable domain" and Weir et al. teaches "heavy chain" binding, the rejection is withdrawn upon further consideration.

Maintained Rejection

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

11. Claims 9 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dower et al. U.S. Patent 5,427,908 filed May 1, 1990 and Taub et al. JBC 264(1): 259-265, 1989.

For present claim 9, Dower et al. teach methods of producing filamentous bacteriophage surface expressing binding domains of antibody fragments including VH that are encoded by nucleic acid sequences and screening the libraries of filamentous bacteriophage including fd, f1, and M13 expressing the VH and/or VL against various antigens, antigenetic determinants, or haptens in order to select a specific binding domain (please refer to the entire specification particularly the abstract; columns 1-12; Example I).

For present claim 13, Dower et al. teach isolating the nucleic acid encoding the antibody fragments from spleen (i.e. peripheral lymphoid tissue, peripheral blood lymphocytes, B-lymphocytes; please refer to column 4 and Example I).

For present claim 14, Dower et al. teach bacteriophage vectors (i.e. phagemid; please refer to the entire specification particularly the abstract; column 1, lines 60-67; column 2, lines 15-43; Example I).

For present claim 15, Dower et al. teach that the nonbound antibodies are washed away and the bound phage can be eluted from the antigen or hapten (please refer to column 10, lines 62-67; column 11, column 12, lines 1-23).

For present claim 16, Dower et al. teach that the previously antigen or hapten bound phage are recovered (please refer to column 11, lines 60-67; column 12, lines 1-31).

For present claim 17, Dower et al. teach recloning DNA from the eluted and recovered previously antigen or hapten bound phage particles via expression in a suitable eukaryotic or prokaryotic expression vector for production of large amounts of the binding domain protein (please refer to column 12, lines 32-41).

However, the main focus of Dower et al. is screening for VH and VL combinations.

For present claim 9, Taub et al. teach screening for binding of heavy chain CDR domains particularly CDR3 including competitive binding assays (please refer to the entire reference particularly the abstract; pages 261, right column; page 262-264; Figures 3-6).

The claim would have been obvious because the substitution of one known element (phage-displayed VH-VL as taught by Dower et al.) for another (i.e. CDR alone as taught by Taub et al.) would have yielded predictable results (i.e. binding to epitopes/antigens) to one of

ordinary skill in the art at the time of the invention. In addition, the claims would have been obvious because a particular known technique (i.e. phage display of polypeptides for screening assays as taught by Dower et al.) was recognized as part of the ordinary capabilities of one skilled in the art. See *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007).

Arguments and Response

12. Applicants' arguments directed to the rejection under 35 USC 103 (a) as being unpatentable over Dower et al. and Taub et al. for claims 9 and 13-17 were considered but are not persuasive for the following reasons.

Applicants contend that the CDR taught by Taub et al. and the antibody heavy chain variable domain as presently claimed are two different structures and that Dower et al. does not teach screening an antibody heavy chain variable domain.

Applicants' arguments are not convincing since the teachings of Dower et al. and Taub et al. render the method of the instant claims *prima facie* obvious.

It is the position of the examiner of record that a "region" is a "domain" (also see the present specification, paragraph 5 where the terms are utilized interchangeably; "four domains, one corresponding to the V region and three domains (1, 2, 3) in the C region). Therefore, "an antibody heavy chain variable domain" is interpreted as FW1-CDR1-FW2-CDR2-FW3-CDR3-FW4; CDR1; CDR2; CDR3; etc. (i.e. any structure comprising an antibody variable domain/region). In addition, the specification (paragraph 5) first "defines" heavy chains as having a V (i.e. variable) region and three C (constant) regions wherein the V region is further broken down into three complementarity determining regions (CDR; variable domain of V region) and four framework regions (FR/FW).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Future Communications

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMBER D. STEELE whose telephone number is (571)272-5538. The examiner can normally be reached on Monday through Friday 9:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on 571-272-0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Amber D. Steele/
Patent Examiner, Art Unit 1639

February 11, 2009